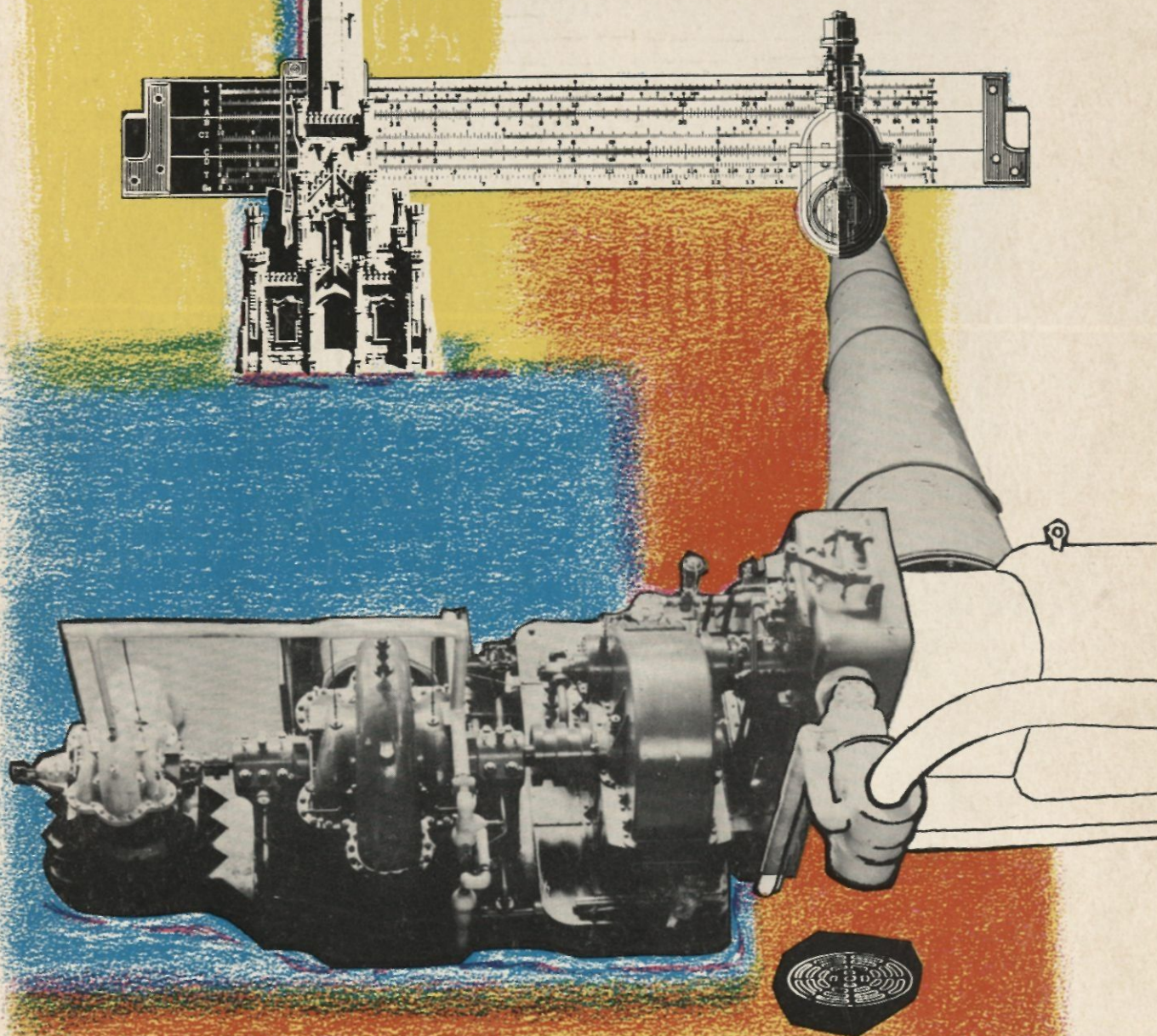


628  
C49ar  
1959, pt.1

STATE WATER SURVEY DIVISION  
LIBRARY COPY

# ANNUAL 1959 REPORT



**DEPARTMENT OF WATER AND SEWERS  
CITY OF CHICAGO  
Richard J. Daley, Mayor**



The Honorable Richard J. Daley, Mayor  
The Honorable Members of the City Council  
City of Chicago, Illinois

Gentlemen:

In 1959, the Department of Water and Sewers advanced programs and policies to help make the people of Chicago the healthiest in the Nation, and meet the City's ever increasing industrial needs. This report describes departmental achievements for the year and, wherever possible, indicates the gains of the past half century. Two separate technical supplements to this report  
Water and the Bureau of S

In 1959, 377 billion  
23 miles of water mains v  
built. Other improvement  
Second Street pumping sta  
Power Plant, at 29th Stre  
79th Street tunnel was pla  
construction of the new S  
S. Kedvale Avenue, to be c

Total revenues, incl  
miscellaneous sources, in  
fixed assets, calculated at c  
\$338 million. These figure  
with the growth of Chicag  
City sold \$30 million in wa

The Departmental Sal  
1959. The 1958 accident  
for 1959; the 1958 acciden  
1959. Employee lost-time  
in 1958 to 1881 in 1959  
operating costs and less in  
will earn the Department  
Award of Honor, the fou  
this award.

The employees of th  
out the year and, as a re  
which hampered the vast  
at optimum capacity. We  
every employee for a job

Further, we wish to t  
trial groups, and above all  
tion and assistance which  
created on January 1, 195

And finally, Mr. May  
for your guidance and su  
this Department in meetin  
services for a growing me  
we believe Chicago will i  
America in the field of su  
so vital to their life, health

ILLINOIS STATE WATER SURVEY LIBRARY COPY

DATE DUE

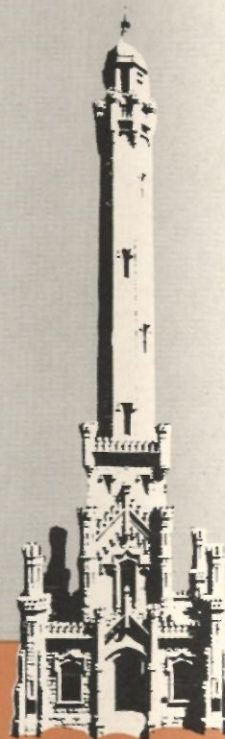
628 C49ar 1959, pt.1 07081003	City of Chicago, Department ANNUAL REPORT, DEPARTMENT OF WATER AND SEWERS, CITY OF CHICAGO.
DATE	ISSUED TO

628 C49ar 1959, pt.1 07081003	City of Chicago, Department ANNUAL REPORT, DEPARTMENT OF WATER AND SEWERS, CITY OF CHICAGO.
---	---

DEMCO

JAMES W. JARDINE

Commissioner of Water and Sewers



The OLD WATER TOWER . . . symbol of Chicago's past  
signifying the great faith of her early citizens in their City's  
future . . . a monument to the vision and skill of water-works  
engineers of a pioneering era.



"I do not believe in public services at the minimum. We must take first things first. We must concentrate our efforts on services which are essential to make the people of Chicago the healthiest, best protected and most prosperous in the nation."

— Richard J. Daley, Mayor

Chicago's South District Filtration Plant



## THE CHICAGO CITY COUNCIL

**RICHARD J. DALEY**  
MAYOR

**DORSEY R. CROWE**  
PRESIDENT PRO TEM

**JOHN C. MARCIN**  
CITY CLERK

**ROBERT J. COLLINS**  
DEPUTY CITY CLERK

### ALDERMAN

#### Ward

1. John D'Arco
2. William H. Harvey
3. Ralph H. Metcalfe
4. Claude W. B. Holman
5. Leon M. Despres
6. Sidney A. Jones, Jr.<sup>1</sup>
- Robert H. Miller<sup>2</sup>
7. Nicholas J. Bohling
8. Einer Johnson<sup>1</sup>
- James A. Condon<sup>2</sup>
9. Reginald DuBois<sup>1</sup>
- Dominic J. Lupo<sup>2</sup>
10. Emil V. Pacini
11. Stanley J. Nowakowski
12. Arthur V. Zelezinski
13. John E. Egan

#### Ward

14. Joseph P. Burke
15. Joseph J. Krska
16. Paul M. Sheridan
17. William T. Murphy<sup>1</sup>
- Arthur A. Slight<sup>2</sup>
18. Frank J. McGrath<sup>1</sup>
- James C. Murray<sup>2</sup>
19. Thomas F. Fitzpatrick
20. Kenneth E. Campbell
21. Charles S. Bonk
22. Otto F. Janousek
23. George J. Tourek
24. Benjamin F. Lewis
25. Vito Marzullo
26. Mathew W. Bieszcza

#### Ward

27. Harry L. Sain
28. Patrick P. Petrone<sup>4</sup>
- Anthony G. Girolami<sup>5</sup>
29. Thomas F. Burke
30. Daniel J. Ronan
31. Thomas E. Keane
32. Bernard C. Prusinski<sup>1</sup>
- Robert J. Sulski<sup>2</sup>
33. John B. Brandt
34. Herbert F. Geisler<sup>1</sup>
- Rex Sande<sup>2</sup>
35. Casimir C. Laskowski
36. Robert J. Massey
37. Paul T. Corcoran
38. William J. Cullerton

#### Ward

39. George L. Buckley<sup>1</sup>
- Philip A. Shapiro<sup>2</sup>
40. Seymour F. Simon
41. Harry Bell
42. Dorsey R. Crowe
43. Mathias Bauler
44. John C. Burmeister<sup>1</sup>
- Thomas Rosenberg<sup>2</sup>
45. Charles H. Weber
46. James F. Young
47. John J. Hoellen
48. Allan A. Freeman<sup>1</sup>
- Morris Hirsh<sup>2</sup>
49. David L. Hartigan<sup>6</sup>
- Paul T. Wigoda<sup>5</sup>
50. Jack I. Sperling

1. Served to April, 1959  
2. Elected April, 1959

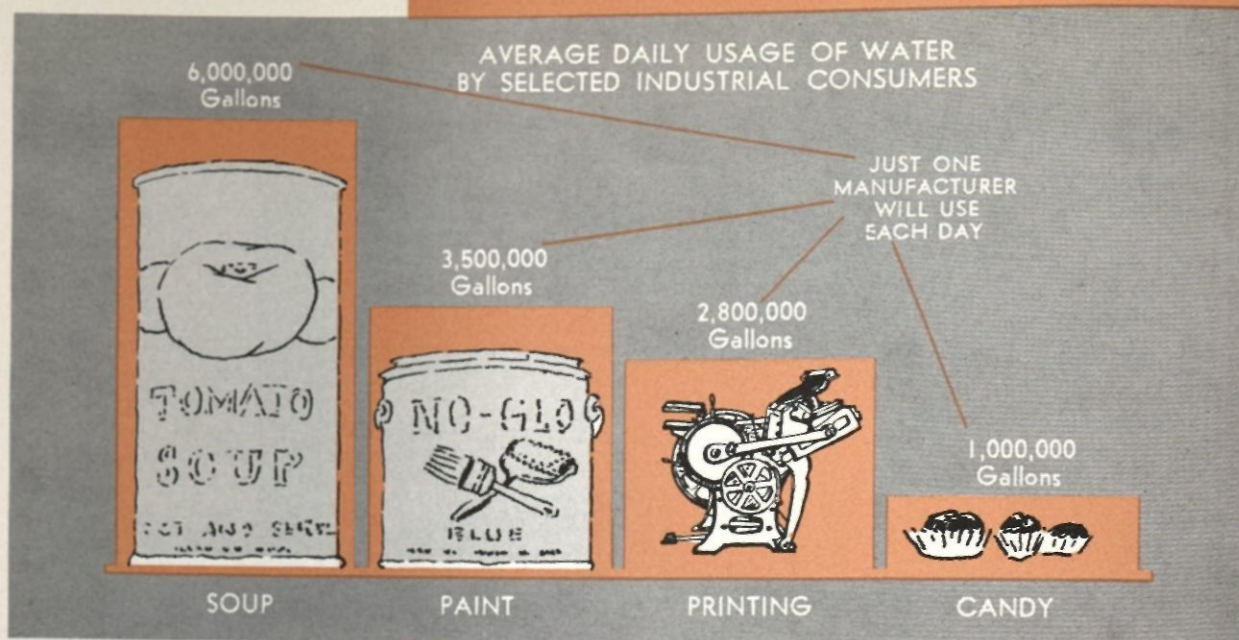
3. Resigned January 6, 1959  
4. Deceased June 17, 1959

5. Elected November, 1959  
6. Deceased April 28, 1959

Edward J. Padden, Chief Clerk  
Clement J. McDermott, Assistant Sergeant-at-Arms

William F. Harrah, Sergeant-at-Arms  
Michael Coletta, Assistant Sergeant-at-Arms





## AS CHICAGO GROWS . . . SO DOES ITS WATER WORKS



*Chicago could neither live nor grow without water.*

An average of 220 gallons of water per capita must be pumped daily by Chicago's water utility: water used for sanitation, in industry and commerce, for washing the produce of the farm, for the meals prepared by the housewife, for sprinkling lawns and parks, in fire engines and fire hydrants, in automobiles, swimming pools, laundries, and restaurants—in short, for the innumerable domestic and industrial uses required by the Nation's second largest urban community.

The industrial prosperity of the Chicago metropolitan region, the billion dollar pay roll of its workers, and the health and welfare of all its citizens are directly tied to the life-giving waters of Lake Michigan. All of the lake's water used in Chicago and 58 suburbs is pumped, purified and distributed by the Chicago Department of Water and Sewers.

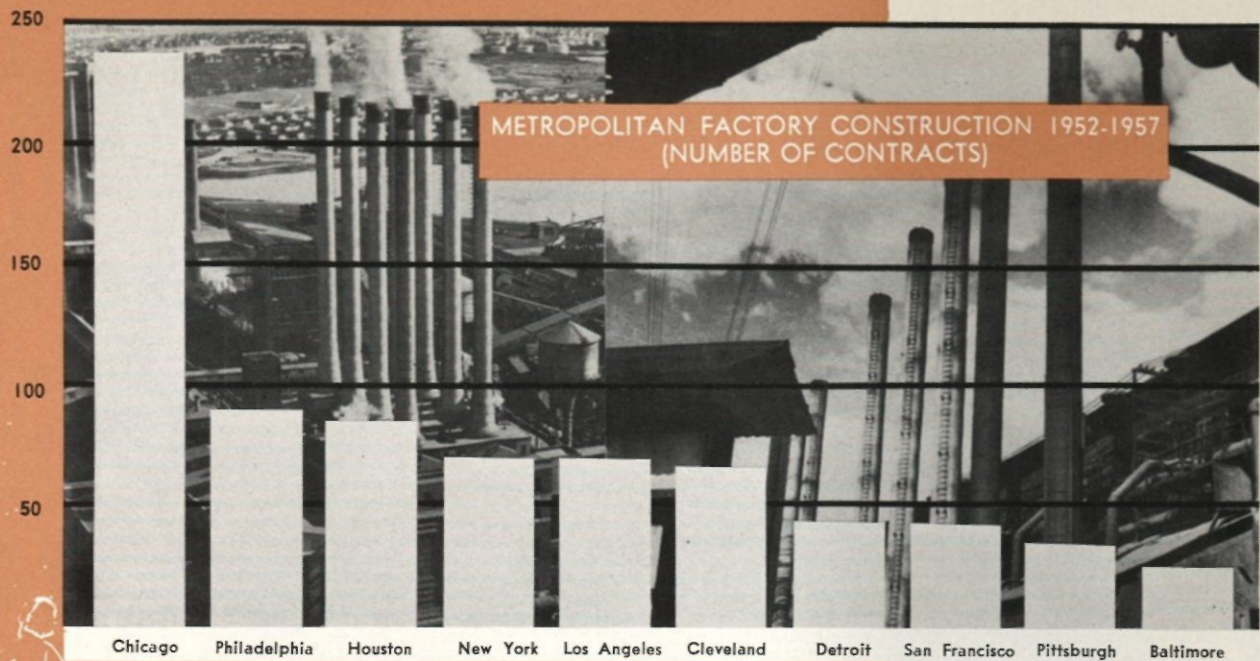
It is seldom realized how vital water is to this region's economy. Much of the City's water is used by industry. Last year, a single manufacturer of soups used six million gal-

lons of water each day in preparation of his product; a paint company used three and one half million gallons a day; a printing company used well over two million gallons a day, and a candy company used a million gallons a day. Chicago, rail crossroads of a continent, supplied 20 million gallons of water each day to its 36 major rail lines. And the stockyards, in the geographic heart of the Nation's marketbasket, used 17 million gallons of water daily.

Industrial activity in the 371 square mile Chicagoland region depends on the Chicago Department of Water and Sewers to furnish a pure and abundant supply of water. So do nearly 4.7 million residents of the City and 58 nearby suburbs. Both Chicago's industry and population are growing, and will continue to grow at impressive rates. It is to meet the needs of this future growth that the City has undertaken one of the most extensive waterworks capital improvement programs ever attempted by an American water utility.

Each year the City charts a new Five-Year program. Between 1953 and 1959, over





**The Chicago Water System Supplies . . .**  
**220 gallons of water to**  
**4,690,000 people in a**  
**371 square mile area including 58 suburbs . . . EVERY DAY**

\$144 million were invested in building new facilities: filtration plants, pumping stations, tunnels, mains, and a reservoir. A Five-Year \$128 million program was initiated in 1959, and the \$24 million outlay for that year exceeded the combined 1958 expenditures for waterworks capital improvements of Baltimore, St. Louis, Boston, Pittsburgh, Cleveland, Milwaukee, Buffalo, and Minneapolis.

The capital growth program of Chicago's waterworks system is financed by the sale of waterworks certificates of indebtedness. Interest is paid on these borrowings and the certificates are redeemed with revenue collected from the sale of water. Thus, the water utility development program is underwritten by revenues from domestic and industrial water users of the metropolitan area. The vast water requirements of the healthy, burgeoning, Chicago industrial complex is a prime factor in the consideration of bond buyers who seek the assurance that waterworks certificates are sound investments. Chicago's industrial growth is also an excellent yardstick by which to judge future demands on the water utility.

During the 1950's more than 3,500 plants were constructed or expanded, and between 1952 and 1957 factory construction was more than twice that of Philadelphia or Houston; three times that of New York, Los Angeles or Cleveland, and five times that of Detroit, San Francisco, Pittsburgh, and Baltimore. There is no doubt that water, workers, and the City's central geographic location played a major role in this expansion. In fact, since the termination of the Second World War, industrial development here has amounted to \$4 billion and continues to grow at a rate greater than \$300 million a year. In addition, Chicago retail sales are about \$6 billion annually and Chicago wholesalers do about \$22 billion in business annually. Figures for the Fifties are expected to dwarf the impressive statistics compiled by the Chicago Association of Commerce and Industry for the years 1935 through 1946. These years saw an increase of 332 per cent in retail trade; 407 per cent in wholesale trade; and 476 per cent in manufactured output.

*But industrial growth is only half the Chicago Story . . .*



## THIRTY YEARS OF PROGRESS

The City water utility must also supply water for a rapidly expanding population. Chicago's metropolitan area population ranks fifth among the cities of the Western World, after New York, London, Moscow, and Paris. Its modern methods for supplying the metropolitan area are the principle reason water engineers from other nations find visits here so worthwhile. (See Inside Back Cover.) The Chicago area's population increase is one of the more spectacular in the Nation. According to the U. S. Census forecast, 1960 should indicate a metropolitan area population increase of approximately one million over 1950. This growth is equal, in population, to nine cities the size of Wilmington, Del.; three cities the size of Atlanta; two cities the size of Cincinnati or one city such as Cleveland. To provide expanded water works facilities for a population increase of this size is no easy matter. Half of this increase has been within the supply area of the Department of Water and Sewers.

In 1949, the Chicago water works system supplied 4,134,000 Chicago and suburban residents. In 1959, it supplied 4,690,000 residents—or an increase of over a half million users. Figures for the City and suburban areas highlight this constant growth: (see Exhibit next page.)

The number of suburban users supplied by Chicago's water utility has increased more than eight times over the past three decades. There were less than 100,000 suburban users in 1930; there are over 800,000 today. Indications are that the suburbs will continue to grow rapidly. More than any other factor, suburban growth accounts for the upturn in waterworks pumpage in the past half decade.

CHICAGO IS THE FIFTH  
LARGEST CITY OF THE  
WESTERN WORLD

Between 1956 and 1959, water pumpage within the City limits actually decreased somewhat; but this has been more than offset by rising suburban demands. Thus figures for this recent period indicate a small increase in pumpage for the total area served by the waterworks system.

*The single most significant waterworks fact has been the decrease in pumpage between 1929 and 1959 although industrial and population demands have shown record-breaking growth.*

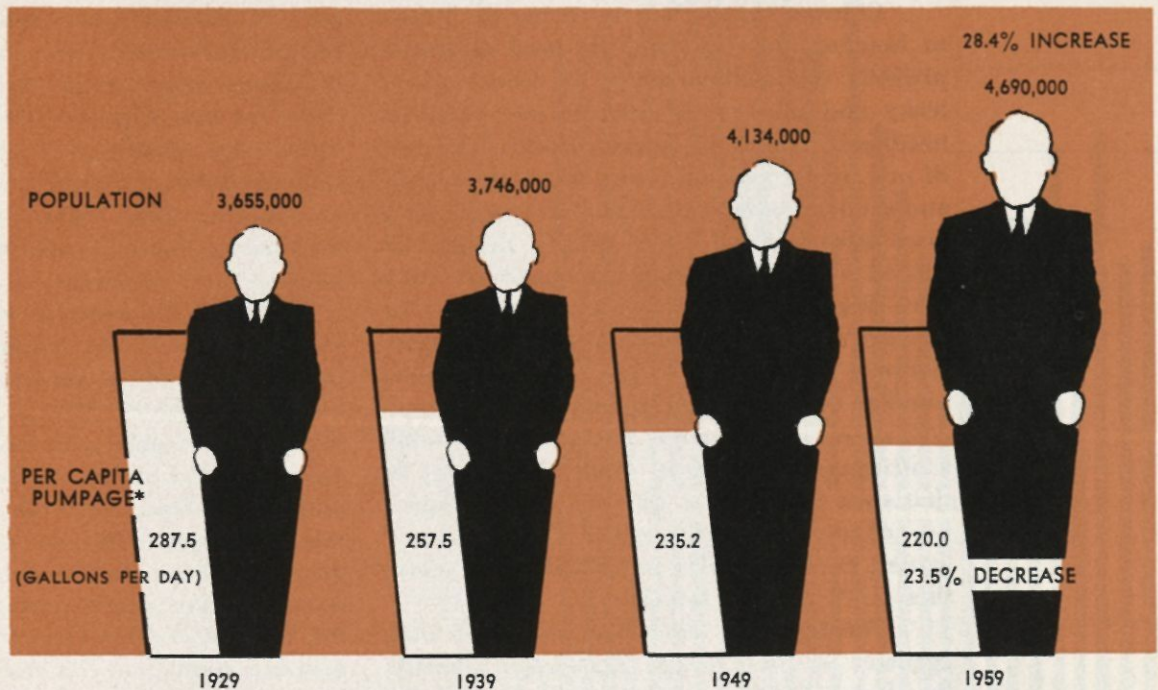
The total average daily water pumpage in the past three decades has declined from 1 billion 50 million gallons to 1 billion 34 million gallons. This indicates that, although Chicago has plentiful quantities of water from Lake Michigan to meet industrial and domestic needs, the City today actually pumps less water than 30 years ago. *This gain has been made in the face of an eightfold increase in suburban population, a population increase of 500,000 in the Central City, and a more than 476 per cent increase in manufactured output!*

There is a twofold explanation for this fact. First, many sub-standard buildings which wasted large quantities of water have been demolished to make way for new developments; second, the City water utility has made impressive gains in the elimination of leakage and in more judicious water usage in the home. . . .

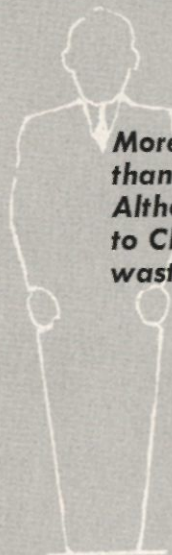


# POPULATION UP - PUMPAGE DOWN

## THE CHICAGO WATER SYSTEM COMPARISON OF TOTAL PUMPAGE\* & POPULATION SUPPLIED



\*PUMPAGE INCLUDES ALL WATER PUMPED BY THE SYSTEM FOR DOMESTIC, INDUSTRIAL, COMMERCIAL, FIRE PROTECTION USAGE, ETC.



**More water-using appliances are being used by Chicago families than ever before. As a result, more water is being used in the home. Although the population has increased, pumpage has decreased due to Chicago's Conservation Programs that have greatly reduced water wastage and underground leakage.**





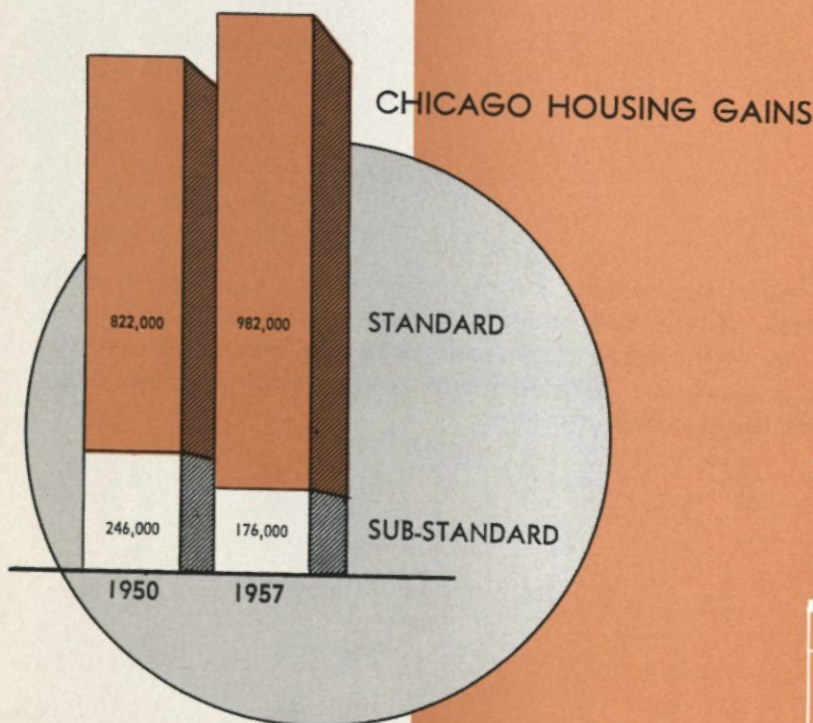
## HOW CITY PROGRAMS CONSERVE

Chicago led the Nation during the Fifties in housing development. Its land clearance projects demolished acres of slums where leaky and unrepaired faucets and facilities needlessly taxed the water utility. The rise of new apartment buildings, housing projects and modern commercial establishments have been accompanied by a steady decline in wasted water. Still other sub-standard areas have been levelled to clear a pathway for Chicago's billion-dollar expressway program. Between 1950 and 1957, alone, the total number of dwelling units listed as sub-standard were reduced from 246,000 to 176,000—a striking reduction of over 28 percent in that time span. In a like period, the number of dwelling units rated as "standard" gained from 822,000 to 982,000—or more than a 19 percent increase.

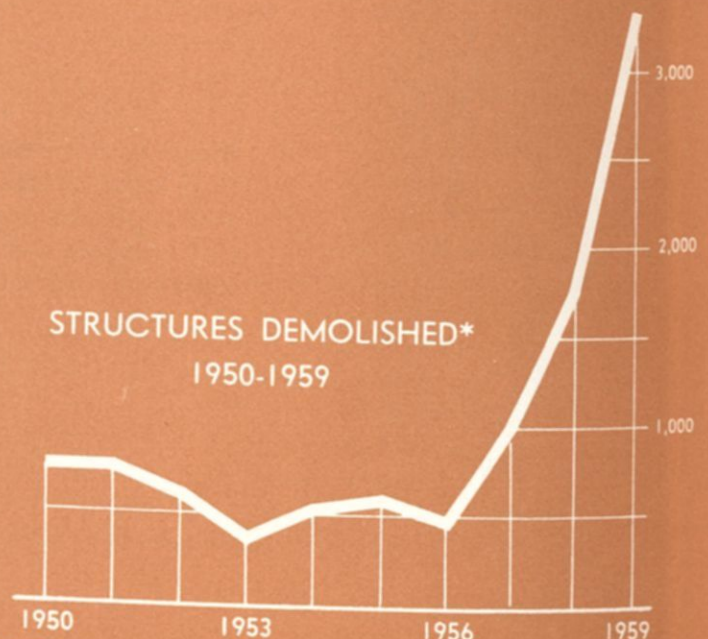
Through the concerted action of such agencies as the Chicago Housing Authority, the Land Clearance Commission, and the Building Department, in co-operation with the Department of City Planning, the num-

ber of sub-standard dwellings demolished has grown steadily. Prior to 1956, about 500 dwellings were razed annually. Since that time, as the Exhibit below indicates, this figure has increased more than six times. Consequently, Chicago's inventory of good housing has risen higher than ever before in its history—with a companion increase in improved water usage.

One of the most revealing yardsticks of water savings is the "night demand." Water use is at its minimum in the early morning hours and Water Distribution Division engineers have confirmed that a high night rate indicates that water is being wasted. They have found that, wherever sub-standard property has been cleared and replaced, night demands have fallen markedly. Generally speaking, the night demand has decreased for the entire City. Other reductions in this demand stem from an intensive program of house-to-house leak inspection, the replacement and repair of water mains, and other improvements in operating techniques.



STRUCTURES DEMOLISHED\*  
1950-1959



\*BY LAND CLEARANCE COMMISSION, BUILDING DEPARTMENT, BOARD OF EDUCATION, PARK DISTRICT & CHICAGO HOUSING AUTHORITY.



## WATER SUPPLY

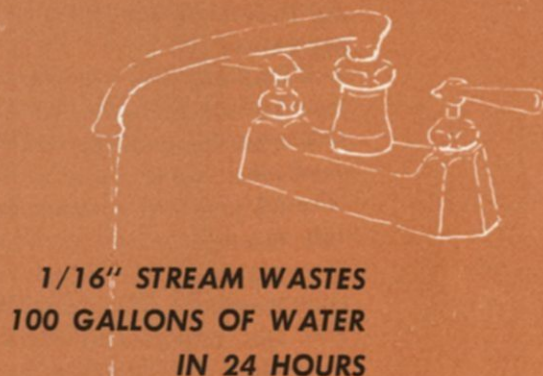
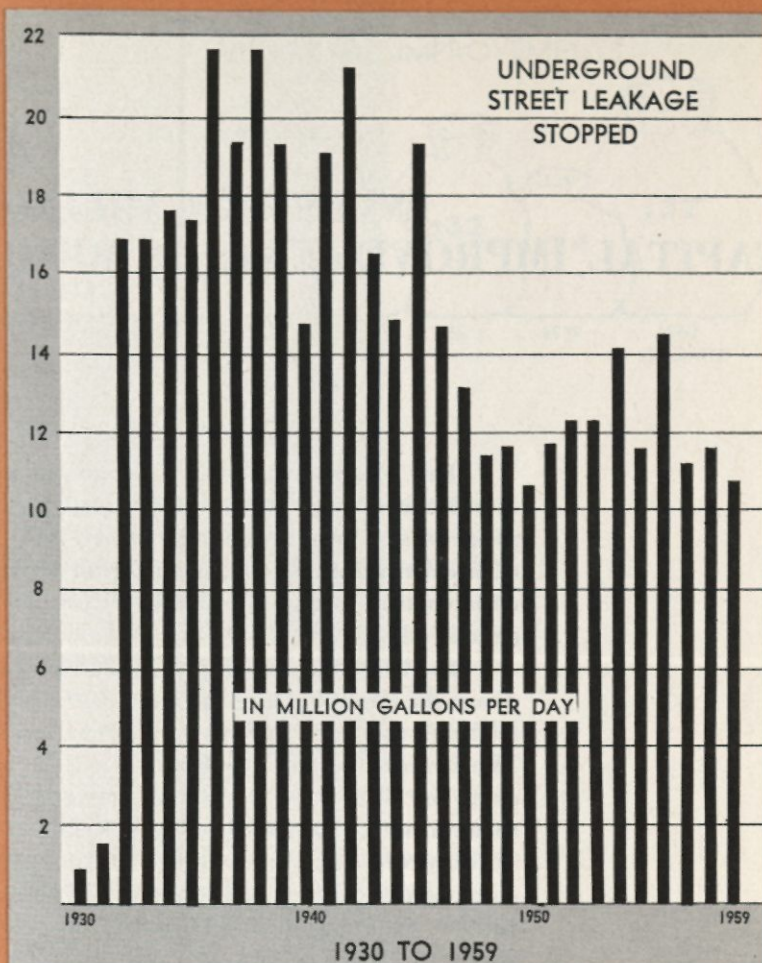
**House-to-House Leak Inspection:** In 1959, 31,999 homes were inspected and over 16,973 leaks were discovered and eliminated. When one considers that a leak the size of the head of a straight pin one-sixteenth of an inch can waste 100 gallons a day, the importance of this program cannot be underestimated. From its inception in 1942, the house-to-house survey program has resulted in the elimination of several hundred thousand plumbing leaks.

**Underground Leak Detection:** Leakage in the nearly 4,200 miles of mains underneath the City has been greatly reduced by means of the underground leak detection program. Since 1932, this program has resulted in the saving of tens of billions of gallons of water as Exhibit to right indicates.

Each year since 1932, leakage in excess of ten million gallons per day has been discovered and stopped. In several of these years, more than twenty million gallons of water per day were saved. It should be noted that the effect of this program is cumulative.

The net effect of these vital water-saving programs, programs which detect and stop waste and those that eliminate unnecessary water usage, has been to lower pumpage demands on the Chicago system over a thirty-year period despite a contrary national trend. These savings have been made also during high-water marks of industrial and population growth in the metropolitan area.

*Chicagoans and suburban users today actually use more water in their homes than they have at any time in the past. Air-conditioning units, automatic dishwashers, washing machines and other water-using appliances increase water usage. But although the housewife uses more water today, the per capita figures for Chicagoans have declined strikingly as a result of the water-saving and housing programs. Therefore, although water use has decreased from nearly 300 gallons per person in 1930 to 220 gallons in 1959, this is not because Chicagoans are using less water in their homes and businesses. They are using more, but savings elsewhere in the system have overbalanced this increase.*





## INVEST \$24 MILLION IN CAPITAL IMPROVEMENTS DURING 1959

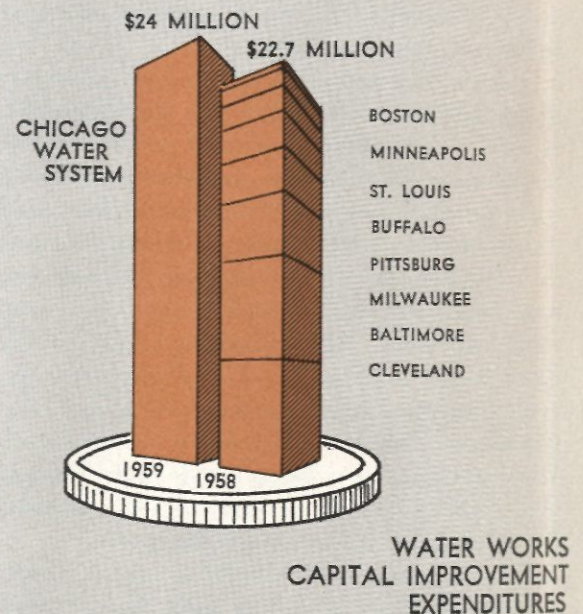
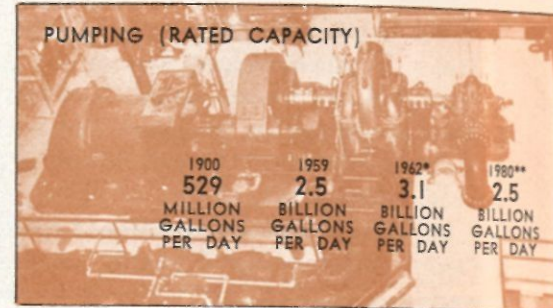
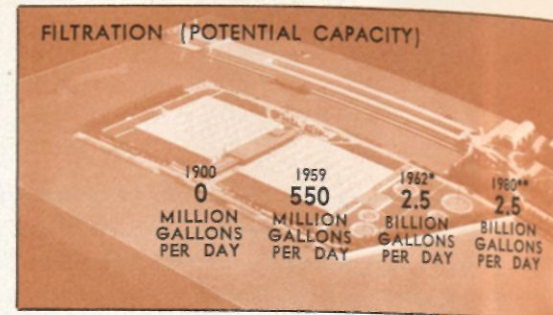
Few cities can match Chicago's achievements in waterworks capital improvement programs. These achievements are the result of a continuing Five-Year program in which construction plans are detailed for the half decade ahead.

In 1959, for example, a \$128 million program was launched for the years 1959-63. Of this sum, \$24 million was spent in 1959. The balance — \$104 million — will be spent over the following four-year period. These expenditures are for the water utility alone. Seventy-one million dollars will be spent to construct auxiliary outlet sewers in the same period to expand public sewer system capacity.

Of the 18 largest U. S. cities, only New York has spent more on capital improvements for waterworks in recent years, according to the U. S. Department of Commerce. (See Exhibit to right.) Chicago's Five-Year water utility improvement program ending December 31, 1959, recorded the following gains:

- 165 miles of water mains constructed.
- 10 miles of water tunnels constructed.
- The Central District Filtration Plant (See Inside Front Cover) brought to 55 per cent completion.
- Modernization work at seven pumping stations: 68th Street, Mayfair, Roseland, Chicago, Western, Jefferson, and Central Park.

Since the creation in 1953 of the Department of Water and Sewers, far-sighted management programs have constantly highlighted the need for increased capital works development to prepare for anticipated future growth. Thus, from an annual expenditure of \$7.6 million in 1953, capital works outlays rose to \$22 million in 1957, then \$24 million in 1959, and a record \$37 million



will be spent for this purpose in 1960. (See Exhibit next page.)

Approximately seven million people will be residents in this area in 1980, the majority of whom will be dependent on Chicago's water utility. By 1962, however, present plans will provide the water utility with sufficient capacity to meet even the high anticipated demands of 1980—eighteen years in advance! Some idea of the sound, steady growth of the Chicago water utility may be gained from exhibits which indicate the increase in plant capacity: Filtration, Tunnel,



\*EST.  
\*\*EST. MAX. HOUR DEMAND

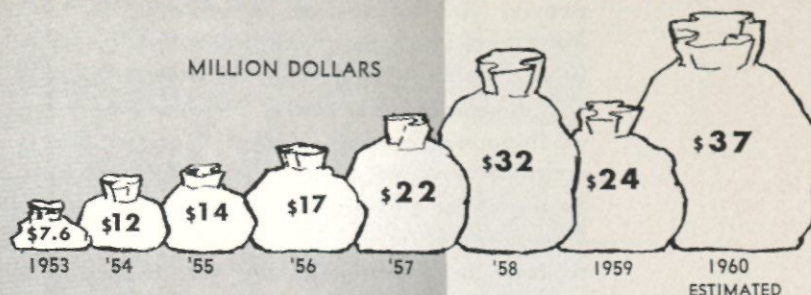
# TUNNELS (CAPACITY)

1900	1959	1962*	1980**
580	2.4	2.9	2.5
MILLION GALLONS PER DAY	BILLION GALLONS PER DAY	BILLION GALLONS PER DAY	BILLION GALLONS PER DAY

# MAINS (MILES)

1900	1959	1962*
1,872	4,175	4,250
MILES	MILES	MILES

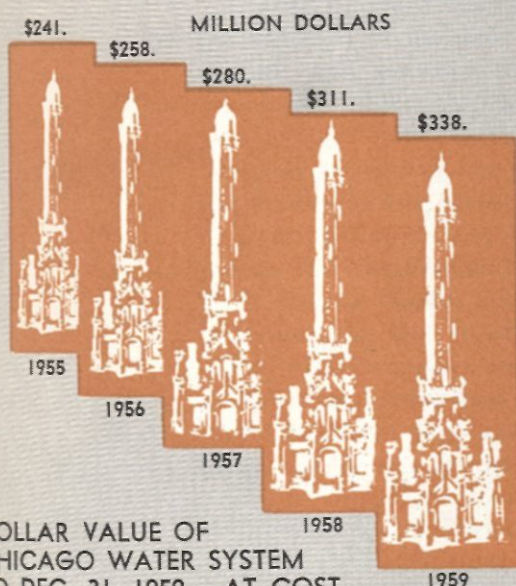
# EXPENDITURES FOR CAPITAL IMPROVEMENTS



least 3,100 million gallons per day capacity in 1962, after the completion of the Southwest Pumping station and improvements in other stations. At the turn of the century, tunnel capacity was 580 million gallons per day. To-day it is 2,410 million and it will be increased to 2,900 million gallons per day in 1962.

Such overall increases in plant capacity do not tell the whole story. It should be remembered that these figures indicated expansion only, and that recent years have seen the replacement of a considerable amount of old equipment with modern equipment.

Perhaps the best yardstick for taking the measure of the water utility system's growth is the value of its total assets. In 1957, the water utility was valued at \$280 million. The next year this rose to \$310 million, and at the decade's end it stood at an estimated record high of \$338 million. (See Exhibit to left.) Highlights of the 1959 waterworks capital improvement program included installation of an 85 million gallon per day pump in Western Avenue Station and a 50 million gallon a day pump in Sixty-Eighth Street station. Two more pumps of comparable capacity are scheduled to be placed in these stations in 1960. At Mayfair station, foundations for two new 80 million gallon per day units were built, and a 500 horsepower boiler was installed. General improvements throughout City pumping stations of this nature made possible the deactivation of the Twenty-Second Street pumping station which had served the City a total of 83 years. This building will be demolished in 1960. Also in 1959, the 79th Street water tunnel was placed in operation, and 23 miles of water mains were built, many in the area of the new Southwest pumping station to be constructed by 1961.



DOLLAR VALUE OF CHICAGO WATER SYSTEM TO DEC. 31, 1959—AT COST

Pumping, and Water Mains. Construction of the South District Filtration plant brought the City's potential purification capacity to 550 million gallons of water daily. Expansion of this plant by fifty per cent and completion of the Central District filtration plant will raise filtration capacity to 2.5 billion gallons a day. Where Chicago had 1872 miles of water main in 1900, it has over 4,138 today, and will have 4,250 in 1962. And where Chicago had rated pumping station capacity of 529 million gallons a day in 1900, it has 2,570 million today and will have at



An invaluable benefit of Chicago's waterworks modernization program is the improved fire protection it affords. Between 1900 and 1959, the number of fire hydrants in service increased from 19,000 to 45,000. Old hydrants have been replaced by those of the most modern design. Today, ninety-eight per cent of all hydrants have two ports each of four and one-half inch diameter. The Water Distribution Division is planning to replace the balance of the old hydrants in use by 1961. This improvement will enable the fire department to function more effectively.

The new Chicago hydrant utilizes a standpipe of eight and one half inch diameter. This compares with the four and three quarters inch or six inch standpipe of the older hydrants. The new type standpipe reduces friction loss to about one-fifth that of the older hydrants during periods of peak capacity use. In their most recent report on Chicago, the National Board of Fire Underwriters stated that the Chicago hydrant is "well designed and has low friction loss."

Another betterment which has contributed substantially to the safety of Chicagoans is the increase in City water pressure. This pressure has increased nearly fifty per cent since 1922. City-wide water pressure has climbed from less than 26 pounds at curb in 1922 to nearly 38 pounds in 1959. This gain has been achieved by the addition and expansion of tunnels, pumping stations, and mains in the waterworks system, and the leak-detection program mentioned earlier. Not only is this of benefit for fire service, but it has improved ordinary service, particularly to residents who live in the upper stories of apartment buildings or on high-ground areas.



## INCREASED PRESSURE AIDS FIRE PROTECTION





Chemical tests being performed at South District Filtration Plant Chemical Laboratory.

## HOW CHICAGO'S WATER IS KEPT PURE AND POTABLE

One of the prime objectives of the Department of Water and Sewers is to provide a pure and potable water supply for the people of Chicago. The advanced scientific practices in effect in the Water Purification Division safeguard the public from possible impurities in the water supply. The quality of water pumped into Chicago taps far surpasses the requirements established by the U. S. Public Health Service. In 1959, water processed in the South District Filtration plant, which supplies the southernmost third of the City, contained an average of only 0.002 coliform organisms per 100 milliliters of water. This is far superior to the Federal standard of 1.0 coliform organisms per 100 milliliters. Water distributed north of 39th Street is now chlorinated and will be filtered in 1962, when the Central District Filtration plant is placed in operation. In 1959, the average for all City pumping stations showed only 0.055 coliform organisms per 100 milliliters of water.

Chicago is among the first cities of the Nation in the development of water purification techniques. In 1950, it became the first American city to monitor its water supply for possible contamination from radioactive waste materials or from atomic bomb "fall-out." Many other tests are conducted. Inspectors patrol the lakefront and nearby tributaries of Lake Michigan to detect any possible industrial sewage wastes that might drift near the City crib intakes. Other inspectors take

samples of the water before it enters the City tunnel systems which serve the North, South, and Central areas. These samples are analyzed at the laboratories of the South District Filtration plant, which conducted over 165,000 chemical tests on the City water supply in 1959. Tests are also made to determine the amounts of chlorine and other chemicals necessary to achieve best results in the filtration process.

In addition, the South District Plant's Bacteriological Laboratory conducted examinations of 38,056 water samples from various parts of the system, and recording instruments at the plant monitor water quality continuously.

Lake water processed by the South District Filtration Plant is purified by means of coagulation, settling, filtration and chlorination and further safeguards are used to remove undesirable tastes and odors. Even after water leaves the filtration plant or the 11 City pumping stations, samples are checked by the City's electron microscope to assure its fine quality. The City's water supply is also flouridated to help prevent dental caries among children.

Chicago's water works operating and staff personnel are proud of their product, and its scientists and engineers are conducting extensive research programs to better protect the people of the Chicago metropolitan area.



DOLLAR VALUE OF  
CHICAGO SEWER SYSTEM  
TO DEC. 31, 1959

\$204. MILLION  
ACTUAL COST



\$475. MILLION  
REPLACEMENT  
COST

## SEWER VALUE NEARS HALF-BILLION MARK

The total cost value of the Chicago public sewer system has reached \$204 million and its replacement value, at present prices, is approximately \$475 million. The Bureau of Sewers is one of the largest utilities—public or private—in the Nation. Few municipal utilities have increased as rapidly in size or dollar value.

New construction and the acquisition of 170 miles of Chicago Park District sewers and appurtenances in 1959 brought the total number of sewer miles maintained and operated by the Bureau of Sewers to 3,753.

Forty-nine miles of sewers were built in 1959 by all agencies of government. Over four miles of this total were constructed by the work force of the Bureau of Sewers. Most of Chicago's sewer expansion projects are constructed by contract under the supervision of the Department of Public Works and turned over to the Bureau of Sewers for operation.

The City plans to continue expanding the sewer system. In 1959, a \$71 million Five Year capital improvement program for sewers was started. Some of the projects slated in

this program include the Leamington, Wellington, Near South Side, Blackhawk, Kostner, Central South Side, Paulina, Ardmore, and Beverly-Calumet systems.

Bureau of Sewer engineers in 1959 devoted considerable time to checking sewer plans for Chicago-O'Hare International Airport. This was done in co-operation with the Bureau of Engineering of the Department of Public Works, and the Department of City Planning.

Maintenance of the vast Chicago sewer system required Bureau workmen to conduct 220,170 inspections; make 20,214 repair jobs; scrape nearly five million feet of sewer; clean over a half million catch basins and answer nearly 20,000 complaints in 1959.

The results of the City Sewer construction program have been highly gratifying. One result has been the reduction of underpass flooding during storms. Between 1946 and 1959, underpass flooding reported by the Chicago Transit Authority decreased 83 per cent. This decrease has been accompanied by a notable reduction in the flooding of basements throughout the city.



3,753 MILES OF SEWERS DRAIN CHICAGO'S  
SANITARY WASTES AND SURFACE WATERS



# REVENUE AND EXPENDITURES

## REVENUES

Water bills paid	\$40,582,318
Fees for new service outlets	91,847
Steam furnished to City and County	348,268
Interest received from deposits and investments	572,078
Interest and premium on sale of certificates	71,238
Rents and miscellaneous	508,446
<b>Total revenue</b>	<b>\$42,174,195</b>

## EXPENDITURES FOR OPERATION AND DEBT SERVICE

Total revenue	\$42,174,195
Cost of operations	\$21,169,990
Repairs and maintenance	8,815,831
Judgments	10,112
Redemption of certificates	4,530,000
Interest on certificates and judgments	4,515,295
Refunds on assessments	20,834
<b>Total</b>	<b>\$39,062,062</b>
Balance of current revenue	\$ 3,112,133
Balance from prior years to January 1, 1959	15,102,492
Plus: Collections of accounts receivable previously written off	3,921
<b>Sub-total</b>	<b>\$18,218,546</b>
Less: Accounts receivable written off	\$ 262,088
Increase in reserve set up for Water Pipe Extension Certificates	30,711
	<b>\$ 292,799</b>
Available for capital expenditures and Debt Service Reserve	<b>\$17,925,747</b>
Capital improvements from Revenue in 1959	—0—
Debt Service Reserve at 12/31/59	14,889,853
	<b>\$14,889,853</b>
December 31, 1959 balance available for appropriation and Debt Service Reserve	<b>\$ 3,035,894</b>

## WATER WORKS CERTIFICATES OF INDEBTEDNESS

Balance 1/1/59	\$11,757,629
Certificates issued in 1959	30,000,000
Add: Miscellaneous income	50
Refund due to adjustments of prior years' expense	510,906
	<b>\$42,268,585</b>
Construction and improvement	<b>\$23,962,607</b>
Balance 12/31/59	<b>\$18,305,978</b>

## OTHER CASH ACCOUNT

Cash reserve for redemption of Water Pipe Extension Certificates	\$ 301,911
--	------------

## 1959 EXPENDITURES FOR WATER WORKS CAPITAL IMPROVEMENTS

	Source of Funds
	Water Certificates
Water Works Construction	
Water mains	\$ 4,827,858
Filtration (Central)	11,878,208
Filtration (Central) tunnel	1,143,527
Tunnel — 79th Street	1,610,258
Pumping stations and miscellaneous	4,502,756
	<b>\$23,962,607</b>

The above tabulation represents a preliminary financial summary of the Water Fund. Final financial statements will be included in the City Comptroller's report for 1959.



# 1959 MAJOR WATER STATISTICS

## Population and Area Served (Based on reliable estimates)

Population supplied:	
Chicago	3,850,000
Suburban (Year-end census as revised)	840,000
Total	4,690,000

## Area served (in square miles):

Chicago	224
Fifty-eight suburbs	147
Total	371

## Per Capita Consumption

	Gallons Per Day
Chicago	238
Suburban	141
Average	220

## Chemical and Physical Qualities of Water

Total hardness (as parts per million Calcium Carbonate)	132
Water temperatures: Intake (Dever Crib)	
Average	47.7°F.
Maximum	72.0°F.
Minimum	32.0°F.

## Pumpage

	Gallons
Annual	
Chicago	334,179,000,000
Suburban communities and industries (metered)	43,204,000,000
Total*	377,383,000,000

\*(Amount through Western Ave. Reservoir 1,012,000,000)

Annual Metered Consumption  
in Chicago (47.69%† of Chicago pumpage) 159,376,000,000

†(Percentage of Revenue from Metered rates 77.56%)

Daily	
Total daily average	1,033,927,000
Maximum day, Aug. 25	1,434,330,000
Maximum hour (rate) Aug. 25, 3 P.M.	1,777,000,000
Daily Average—Chicago	915,559,000
Daily Average—Suburban	118,368,000

## Purity Control

Laboratory samples examined:	
Bacteriological Laboratory	38,056
Chemical Laboratory	165,057
Microscopically for plankton	6,958
Electron Microscope	5,836
Total samples examined	215,907

## Bacteriological Results

Annual average coliform organisms per 100 ml*	
South District (filtered)	86.70
North & Central District (chlorinated only)	21.50
Raw	0.002
Plant outlet	0.005
Pumping stations	0.209
Distribution system	0.055
	0.098

\*(U. S. Public Health Service Standard for safe drinking water permits a maximum average of 1.0 coliform organisms per 100 ml.)

## Purification Treatment

	Gallons
Complete Filtration Treatment	131,988,600,000
Chlorination Treatment only	249,288,100,000

## Chemicals Applied — Tons

	Filtration Treatment	Chlorination Only
Chlorine	941	1,249
Aluminum Sulfate (as Al)	4,193	—
Activated Carbon	1,518	—
Lime	1,853	—
Ferrous Sulfate (as Fe)	5,157	—
Ammonium Sulfate	382	—
Sodium Silicate	9	—
Hydrofluosilicic Acid (23%)	2,622	4,001
(As Fluorine)	460	796
Sulfuric Acid	5	—

## Supply

Crib intakes in service	4
Emergency shore intake	1
Miles of water supply tunnels under lake and land (6 to 16 feet in diameter)	67.9

## Pumping — 1959

Pumping stations	11
Pumps available for service	49
Installed pumping capacity (Million gallons per day)	2,570

## Annual Pumpage (Million Gallons)

By electrically driven pumps	135,296
By steam driven pumps	242,087
Total annual pumpage	377,383

Coal used by steam powered pumps (tons)	145,764
Electric power used by electrically powered pumps. (kilowatt hrs.)	67,752,069

## Distribution

Water Mains: (in miles)	
In use—December 31, 1959	4,138.89
Extended	23.15
Abandoned	19.34
Net addition to system	3.81
Diameter of pipe (inches)	1 to 54

## Fire Hydrants:

In use—December 31, 1959	45,121
Installed	1,013
Abandoned	964
Net Increase	49

## Gate Valves:

In use—December 31, 1959	43,298
Installed	442
Abandoned	296
Net Increase	146

Pressure range in mains (lb. per square inch)	25-55
Average pressure at curb (lb. per square inch)	40
Miles of pipe tested for underground leakage	90.09
Underground main leakage stopped 1959—gallons per day	10,828,400
Premises inspected—house to house leakage survey	31,999
Repaired main breaks—4 inch to 48 inch in diameter	203

## Meters:

In service—December 31, 1959	148,354
Installed by master plumbers	1,516
Installed by Water Distribution Division	3,165
Total	4,681
Removed	2,231
Net increase	2,450
Repaired on premises	15,209
Repaired in shops	16,306
Tested	20,774
Non-metered (assessed rate) services	347,497
Total Services (assessed & metered)	495,851



# 1959 MAJOR SEWER STATISTICS

## Existing Sewer System:

Miles of Sewers .....	3,753.27
Catch Basins .....	197,629
Manholes .....	135,814

## 1959 New Sewer Construction:

Miles of Sewers—all sizes .....	49.1
Catch Basins .....	2,334
Manholes .....	1,679
Of the above, 4.3 miles of various sizes of sewers, 62 catch basins and 176 manholes were constructed by Bureau of Sewers work forces.	

Inspections .....	220,170
Complaints Handled .....	19,512

## Repairs:

Total Number of Sewer System Repair Jobs Completed .....	20,214
Main Sewer Breaks .....	461
Catch Basins .....	13,882
Manholes .....	5,424
Gutter Grates and Basin Outlets .....	447

## Cleaning:

Dirt Removed in Cleaning Operations—Cubic Yards .....	236,525
Sewers Scraped—Feet .....	4,839,603
Catch Basins Cleaned .....	537,442
Street Grades Established and Approved by City Council .....	159
Standard Bench Monuments and Ordinary Benches Established .....	19

## Receipts:

House, Drain Permit Fees .....	\$193,785
Other Permit Fees .....	32,009
Special Deposits .....	60,940
Out-of-town Sewer Connection Fees .....	61,559
Drain Layers' License Fees .....	29,750

Total Receipts..... \$ 378,043

Supplements covering complete 1959 water or sewer statistics are available upon request.

## ADMINISTRATION AND FUNCTIONS

The Department of Water and Sewers is divided into two major units—the Bureau of Water and the Bureau of Sewers.

The Bureau of Water provides water to all of Chicago and 58 suburbs, and bills and collects water charges for this service. The Bureau is composed of a Pumping Station Operation Division which operates 4 water intake cribs and 11 pumping stations to pump the water into the system; the Water Purification Division, which operates the water filtration plant and supervises treatment of the water to insure its safety and palatability; the Water Distribution Division, which plans, constructs and maintains the water mains to transport the water from the pumping stations to the user's faucet; the Meter Division,

which maintains and checks the accuracy of the meters that measure the amount of water used by the consumers; and the Collection Division, which bills, collects and accounts for water charges.

The Bureau of Sewers operates and maintains Chicago's vast public sewer system. The Bureau is composed of an Engineering Division that plans and designs sewer repairs and extensions; a Cleaning Division, that flushes and scrapes sewers and cleans catch basins on a district basis; a Repair Division, that makes repairs to the sewer system on a district basis; a Motor Fuel Tax Division, that does both repair and cleaning work on arterial highway sewers and an Inspection Division, that supervises construction and installation of connections.

## DEPARTMENT OF WATER AND SEWERS

James W. Jardine .....	Commissioner of Water and Sewers
Raymond D. Johnso .....	Administrative Engineer

### BUREAU OF WATER

W. W. DeBerard .....	Deputy Commissioner for Water and Chief Water Engineer
H. H. Gerstein .....	Assistant Chief Water Engineer

#### PUMPING

J. L. Weeks .....	Engineer of Water Pumping
-------------------	---------------------------

#### PURIFICATION

J. R. Baylis .....	Engineer of Water Purification
--------------------	--------------------------------

#### DISTRIBUTION

J. T. Garrity .....	General Superintendent
T. F. Foley .....	Assistant General Superintendent
E. Edelstein .....	Chief Engineer

#### METERING

M. I. Sheridan .....	Superintendent
----------------------	----------------

#### COLLECTION

J. J. Ellicott .....	Superintendent
----------------------	----------------

### BUREAU OF SEWERS

Thomas D. Garry .....	Deputy Commissioner for Sewers
Arthur E. Cook .....	Administrative Assistant
A. J. Schafmayer .....	Chief Engineer

#### INSPECTION

Harry M. Forrey .....	Asst. Chief Engineer
-----------------------	----------------------

#### DISTRICT REPAIR

Joseph Rostenkowski .....	Superintendent
---------------------------	----------------

#### DISTRICT CLEANING

John Kilroe .....	Superintendent
-------------------	----------------

#### CONSTRUCTION

Ralph McNamara .....	Superintendent
Vincent Shannon .....	Superintendent

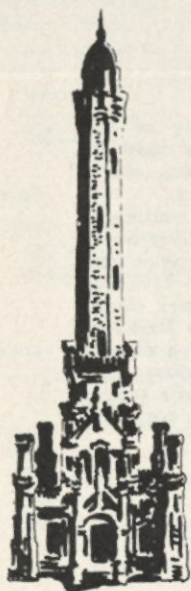
#### ENGINEERING

Tenney S. Ford .....	Engineer
Charles E. Benson .....	Engineer
David Goldberg .....	Engineer

#### ARTERIAL REPAIR AND CLEANING

Edward Gill .....	Superintendent
-------------------	----------------





The problem of obtaining a pure and plentiful water supply is common to all mankind. It is a need which transcends geography and politics, famine and abundance, war and peace, and the rise and decline of nations. The lack of this resource complicates many international problems; for example, the solution to the population explosion is made more grave by the world's underdeveloped water resources.

Whether man can bridge the gap between the growing demand for water and the full utilization of this precious resource, depends in large measure on water works scientists, engineers, operating personnel, and administrators.

Important to the efforts of water works personnel the world over is the free exchange of information concerning modern operating methods and techniques. In 1959, under the auspices of the International Cooperation Administration, the United Nations, the United States Government, and their own governments, a number of outstanding foreign water works administrators, and engineers, (as well as student engineers,) joined thousands of Chicagoans who visited the Chicago Department of Water and Sewers.

Chicago officials learned much from the experts who visited facilities here—and it is hoped that these visitors found their experiences here fruitful and rewarding. The Chicago Department of Water and Sewers—a public utility dedicated to public service—takes pride in listing the names and nations of those technologists who visited Chicago facilities last year in their search for knowledge to satisfy man's unlimited desire for a wholesome, pure, and abundant supply of water.





**EL SALVADOR**  
Twenty-four civil engineers.

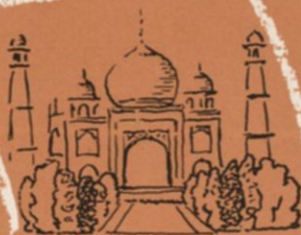


**CHILE**  
Three waterworks engineers from San Diego.

**UNITED NATIONS**  
Mr. Bakerjian, of the United Nations, in Jerusalem, Jordan.



**ISRAEL**  
Mr. Yehuda Gozani, Chief Engineer, Department of Water Supply, Tel-Aviv.



**AUSTRALIA**  
Mr. Allen G. Robertson, Assistant Chief Construction Engineer, Melbourne Metropolitan Board of Works, Victoria.

**BRAZIL**  
Dr. and Mrs. Clovis L. Gomes. Dr. Gomes is Professor of Sanitary Biology and Hygiene at the water and sewage laboratories of the State of Minas Gerais.  
Mr. Santos Jose, waterworks engineer from Sao Luiz.

**SWEDEN**  
Mr. Claes Fischerstrom, senior consulting and research engineer, Stockholm.

**REPUBLIC OF KOREA**

Mr. Kiel Hahm, government engineer, Seoul.  
Mr. Sun Wun Kim, Engineer, and Mr. Shin Yong Kang, Engineer Section Chief, Bureau of Public Works, Ministry of Home Affairs, Seoul.

**FRANCE**

Mr. Charles M. Dubin, Chief Engineer of Compagnie General Deseaux, Paris.  
George Perol and Michel Rochette, hydraulic engineers, French Government.

**INDIA**

Srinivasa Iyenger Rajagopalan, Director of Health Engineering, New Delhi.  
Mr. B. K. Shivalinga, Public Works Department engineer with the government of Mysore.

**ARGENTINA**

Mr. Jose Lasala, civil engineer and architect, Buenos Aires.

**MEXICO**

Nine engineering students from Monterey Institute of Technology.



**THAILAND**

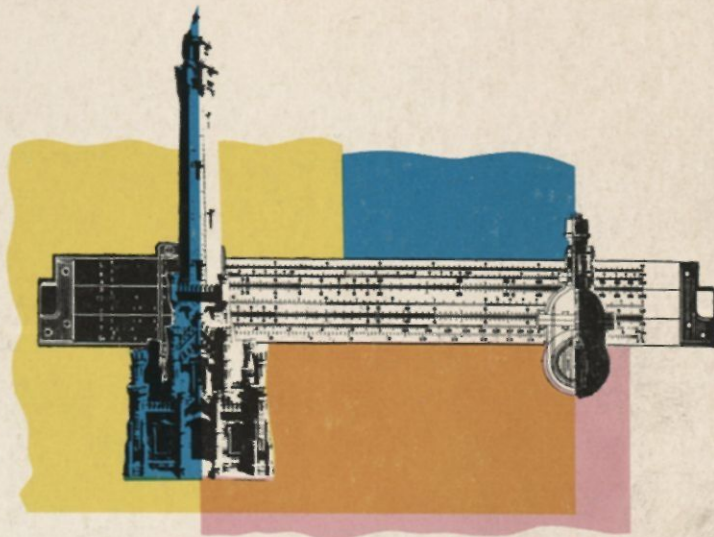
Mr. Prasert Phataraphruk, Civil Engineer, Public Works Division, Bangkok.





ANNUAL  
**1959**  
REPORT

DEPARTMENT OF WATER AND SEWERS—CITY OF CHICAGO



UNIVERSITY OF ILLINOIS-URBANA



3 0112 114157511